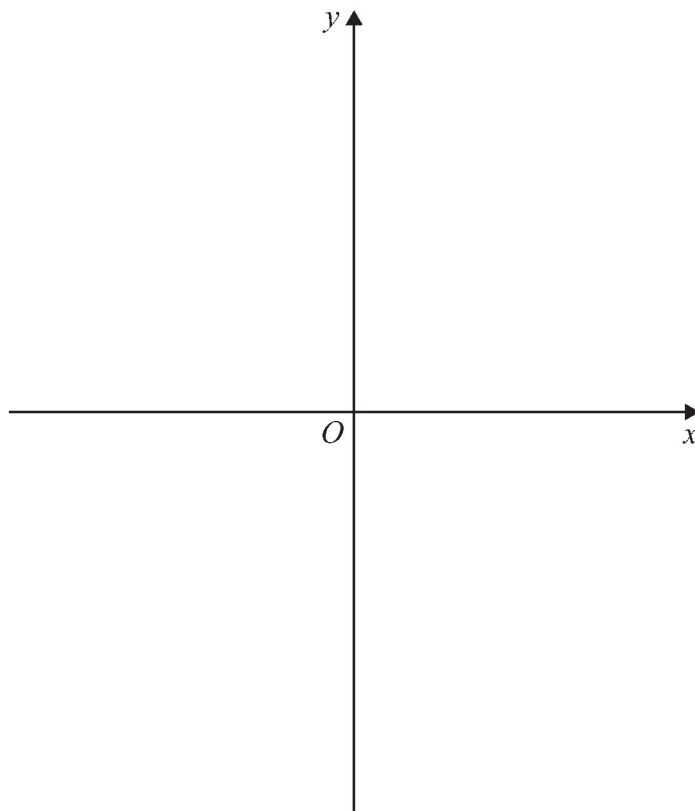


6 (a) Sketch the curve with equation

$$y = x^2(2x + a)$$

where $a > 0$

[3 marks]



6 (b) The polynomial $p(x)$ is given by

$$p(x) = x^2(2x + a) + 36$$

6 (b) (i) It is given that $x + 3$ is a factor of $p(x)$

Use the factor theorem to show $a = 2$

[2 marks]

6 (b) (ii) State the transformation which maps the curve with equation

$$y = x^2(2x + 2)$$

onto the curve with equation

$$y = x^2(2x + 2) + 36$$

[2 marks]

6 (b) (iii) The polynomial $x^2(2x + 2) + 36$ can be written as $(x + 3)(2x^2 + bx + c)$

Without finding the values of b and c , use your answers to parts (a) and (b)(ii) to explain why

$$b^2 < 8c$$

[2 marks]